

Prevalence of Scapular Dyskinesia in Desk Job Worker in Veteran Bank Professions

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Abstract: Background: Scapular dyskinesia is defined as visible alteration in scapular position & motion patterns & is believed to occur as a result of changes in activation of scapular stabilizing muscles. Hence, the repetitive muscular fatigue may directly affect the scapula humeral rhythm, resulting in compensatory increased rotation or destabilization of scapula these alteration in scapular position have implication for reduction in muscle function. The key scapular muscle for scapular stability & mobility are the upper & lower trapezius & serratus anterior muscle. Materials & Methodology: The study design was cross sectional. Total 100 samples were selected by purposive sampling from different Bank at Sangli district. Subjects were assessed for scapular dyskinesia using Modified lateral scapular slide test (MLSSST) with the help of vernier calliper. The measurement was performed bilaterally at 3 different positions (arms by the side, Hands on hips, 90° glenohumeral abduction in scaption with maximal internal rotation and 1 kg load in their hands). Results: The results shows that there were 46% desk job workers who were having scapular dyskinesia and 54% desk job workers who were not having scapular dyskinesia. Hence, prevalence of scapular dyskinesia in desk job worker in veteran bank professions were 46%. Conclusion: In the present study, it concludes that scapular dyskinesia is prevalent among desk job worker in veteran bank professions in all three positions that is arm by the side, hands on hips and 90° glenohumeral abduction in scaption with maximal internal rotation and 1 kg load in their hands).

Keywords: Scapular Dyskinesia, Modified Lateral Scapular Slide Test, Veteran Bank Professions.

1. Introduction

Scapular dyskinesia is defined as visible alteration in scapular position & motion patterns & is believed to occur as a result of changes in activation of scapular stabilizing muscles. [1] Hence, the repetitive muscular fatigue may directly affect the scapulohumeral rhythm, resulting in compensatory increased rotation or destabilization of scapula. [2] These alteration in scapular position have implication for reduction in muscle function. [3] The key scapular muscle for scapular stability & mobility are the upper & lower trapezius & serratus anterior muscle. [4] Three-dimensional biomechanical analysis of possible scapular motions shows that the scapula moves around three axes of motion simultaneously. [5, 6] Patterns of abnormal motion in scapular dyskinesia are best observed by first determining the position of the scapula with the patient's arms at rest at the side, then by observing the scapular motion as the arms are elevated and lowered in the scapular plane. These dyskinetic patterns fall into three categories, which correspond to the three planes of motion on the ellipsoid thorax. [7] This system can help identify the type of abnormal scapular motion.

Kibler had defined three dyskinetic patterns-

Type I is characterized by prominence of the inferior medial border of the scapula due to abnormal posterior tilt the scapula; when this type occur isolatedly, the scapula may be lower than opposite side. . This motion is primarily abnormal rotation around a transverse axis. It indicates presence of weak muscles (serratus anterior, latissimus dorsi, lower trapezius). [2, 8, 9]

Type II is characterized by prominence of the entire medial border of the scapula and represents abnormal rotation around a vertical axis. These types could be seen with superior labrum injuries (SLAPs). [2]

Type III is characterized by superior translation of the entire scapula and prominence of the superior medial scapular border. This type can be seen when the size of the acromioclavicular space decrease or potential rotator cuff injuries occur. It indicates over activity of levator scapulae and upper trapezius along with imbalance of the upper and lower trapezius force couple associated with impingement and rotator cuffs lesions. [2, 8, 9]

Type IV is defined as normal scapular position and motion .Both scapula are symmetrical at rest and during motion ; they rotates symmetrically upward with inferior angle rotating laterally away from midline indicating scapular control muscles are not stabilizing the scapula. [2,8]

The net effect of the scapular dyskinetic patterns is an adverse effect on the normal role of the scapula in shoulder function. [9]

There are many factors which are bone related and joint related, neurogenic that lead to dyskinesia. Bone related factors define as thoracic kyphosis, nonunion/malunion, clavicular fracture. Joint related factors are high-grade acromioclavicular (AC) instability, AC arthrosis, glenohumeral joint derangement and neurologic factors such as cervical radiculopathy or spinal nerve palsy. [3] Also pain, soft tissue tightness, strength imbalance imbalances, muscle fatigue and awkward posture would cause abnormal scapular kinematics. [10] The muscular factor for scapular dyskinesia are lower trapezius & serratus anterior weakness & lower

trapezius hypertrophy.⁴ Physical factors such as prolonged sitting and neck flexion have been reported as predictor of neck pain in population of workers from various industry, health and professional setting.^[11] Extrinsic factor such as repetitive overhead use especially more than 60° of shoulder elevation, sustained overhead work, and higher loads raised above shoulder height. Intrinsic risk factors such as forward head, rounded shoulder posture, altered scapular kinematics and muscle activity play an important role in presence of scapular dyskinesis.^[12] With forward head posture, thoracic kyphosis angle will have increased so that position of the scapula will have altered.^[13]

2. Materials and Method

Study design

This is a case control study. An ethical clearance was obtained from the ethical committee before the commencement of this study.

Participants

Both males and females working in Bank were screened for their eligibility in this study.

Inclusion criteria:

- 1) Age between 35-45 years
- 2) Working at least more than 3 years
- 3) Working continuously for at least 4-5 hrs/day.

Exclusion criteria:

- 1) Having surgical operation related to upper extremity.
- 2) Acquired or Congenital Musculoskeletal disorders
- 3) Subjects that has injury to scapula or shoulder
- 4) Subjects with Neurological conditions.

If the subject fulfilled the inclusion and exclusion criteria, a patient information sheet providing details about the study was given to them. For subjects willing to take part in this study, an informed consent was obtained. A brief assessment of the subject was taken prior to the commencement of the study.

Outcome measures

The primary outcomes for the study were Vernier Calliper for assessment of Scapular Dyskinesis by using Modified Lateral Scapular Slide Test (MLSST). Initially before measuring the scapular position, a brief physical assessment was taken which included demographic data, working years, number of hours each individual works in a day.

Technique

Scapular Dyskinesis was assessed by using Modified Lateral Scapular Slide Test (MLSST) with the help of vernier caliper. First identify and marked the spinous process of the 7th cervical vertebra (C7). After identifying C7, palpated the spinous processes of the vertebrae down to T7 and then marked it with a tag. Then, measured the distance between the inferior angle of the scapulae and the spinous process of T7. Measurements were taken with the participant standing with normal, relaxed posture. The measurements were performed at 3 different positions 1.Arms by the side, 2. Hands on hip, 3. 90° glenohumeral abduction in scaption with maximal internal rotation and 1 kg load in their hands.

Right and left side measurement was recorded. The measurement was done three times. Average of the three readings was considered as final reading. The same procedure was repeated for second position hands on hip and for third position 90° abduction.

3. Result

Table 1: Descriptive Statistics of desk job workers in veteran bank professions

Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation
Age	100	35	45	39.08	6.09
Working years	100	7	16	12.09	2.58
Working hours	100	4	5	4.59	0.49

It was found that mean age of desk job workers was 39.08 years, mean working years were 12.09 years and their average working hours were 4.59 hours a day.

Table 2: Gender wise distribution of desk job workers in veteran bank professions

Gender	Frequency	Percent
Females	33	33
Males	67	67
Total	100	100

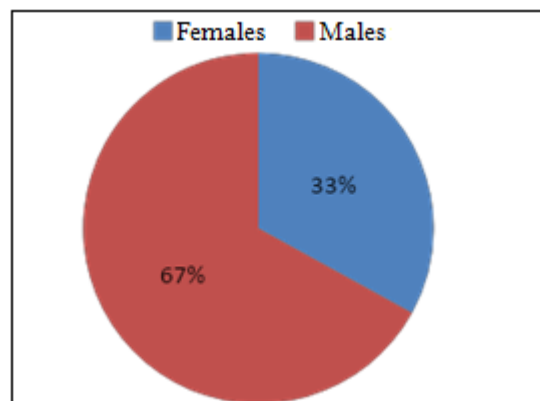


Figure 1: Gender wise distribution of desk job workers in veteran bank professions

Table 2 and fig 1 depicts that, there were 33% females and 67% males in veteran bank professions doing desk job.

Table 3: Scapular Dyskinesis wise distribution of desk job workers in veteran bank professions

Scapular Dyskinesis	Frequency	Percent
Absent	54	54
Present	46	46
Total	100	100

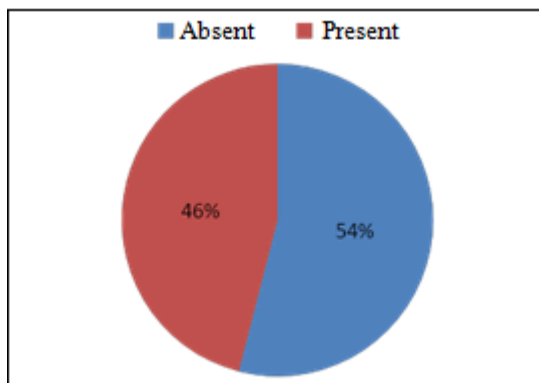


Figure 2: Scapular Dyskinesia wise distribution of desk job workers in veteran bank professions

Table 3 and fig 2 depicts that, there were 46% desk job workers who were having scapular dyskinesia and 54% desk job workers who were not having scapular dyskinesia.

Hence, prevalence of scapular dyskinesia in desk job worker in veteran bank professions was 46%.

Table 4: Association between Scapular Dyskinesia and gender of desk job workers in veteran bank professions

Gender	Scapular Dyskinesia		Total	Chi square statistic	p value
	Present	Absent			
Females	16	48.48	17	0.12	0.73
Males	30	44.78	37		
Total	46	46.00	54		

Chi square test for association was done to compare between Scapular Dyskinesia and gender of desk job workers in veteran bank professions. It was found that, there was no association between Scapular Dyskinesia and gender of desk job workers in veteran bank professions as (p>0.05).

Table 5: Comparison of mean MLSST at right, left and difference

Group	Descriptive Statistics	N	Minimum	Maximum	Mean	Std. Deviation	F statistic	p value
1	Right	100	8.00	10.50	9.67	0.69	110.361	<0.001
2	Right	100	8.50	11.70	10.49	0.75		
3	Right	100	9.00	12.40	11.23	0.78		
1	Left	100	8.00	10.50	9.03	0.77	93.773	<0.001
2	Left	100	8.20	11.60	9.83	0.84		
3	Left	100	9.00	12.30	10.59	0.79		
1	Difference	100	0.50	1.80	1.14	0.40	3.95	0.02
2	Difference	100	0.50	2.00	1.29	0.45		
3	Difference	100	0.50	2.00	1.29	0.44		

One way ANOVA was done to compare between 3 MLSST of desk job workers at right, left and their difference.

- It revealed that, right mean MLSST3 (11.23) was significantly higher than mean MLSST2 (10.49) followed by mean MLSST1 (9.67) (p<0.001)
Tukey's posthoc test was done to compare between which pairs, there was a difference.
It was found that, there was significant difference between all the three points MLSST1, MLSST2 and MLSST3 (p<0.05).
- Left mean MLSST3 (10.59) was significantly higher than mean MLSST2 (9.83) followed by mean MLSST1 (9.03) (p<0.001).
Tukey's posthoc test was done to compare between which pairs, there was a difference.
It was found that, there was significant difference between all the three points MLSST1, MLSST2 and MLSST3 (p<0.05).
- Difference mean MLSST3 and MLSST2 (1.29) was significantly higher than mean MLSST1 (1.14) (p=0.02).
- Tukey's posthoc test was done to compare between which pairs, there was a difference.
It was found that, there was significant difference between MLSST1, MLSST2 and MLSST1, MLSST3 (p<0.05).

4. Discussion

The present study assessed the scapular dyskinesia in veteran bank professions with the help of modified lateral scapular slide test (MLSST) at three different positions. The vernier calliper was used to assess the scapular dyskinesia in veteran bank professions. The result of the study showed that there is significant difference of scapular position in all three positions that is at arms by side, hands on hip and arms elevated to 90° of shoulder abduction in scaption with maximal internal rotation and 1 kg load in their hands in veteran bank professions. Which infers that the scapular kinematics is altered in all three positions in veteran bank professions who works in abnormal posture for long hours which can also lead to pain.

The study shows that there were 46% desk job worker who were having scapular dyskinesia and 54% desk job workers who were not having scapular dyskinesia. Hence, prevalence of scapular dyskinesia in desk job worker in veteran bank professions was 46%.

Musculoskeletal complaints about upper extremity among veteran bank professions are known to be associated with both work-related physical and psychosocial factors. [14] Scapula is a bridge between the shoulder complex and the cervical spine which plays an important role in ensuring both mobility and stability of the neck/shoulder region.

Veteran bank professions generally work at static position with forward head posture and greater shoulder elevation range of motion. Prolonged static posture and increased muscle load will lead to the development of symptoms in the upper extremity.^[15] This position has been shown to change the normal plane orientation of scapula. Weakness in the posterior rotator cuff muscles and Para scapular muscle imbalances cause changing of scapular positions.^[16]

Ludewig P.M found that extensive computer use amongst bank workers has lead to an increase in work related neck pain. Aberrant activity within the three portions of the trapezius muscles and associated changes in scapular posture have been identified as potential contributing factor.

Ranasinghe et al. found that incidence of arm, neck and shoulder complaints was 56, 9 % at office worker using computers. This condition established relationships with work posture (rotation of the head and neck, asymmetric body) and poor work habits (sitting in one position for a long time, repetitive movements or working with lifted shoulders).^[17]

To further support the study Morten Wrested, Therese N Hanvold et al did a systematic review on computer work and musculoskeletal disorders of the neck and upper extremity, the review examines the evidence for an association between computer work and neck and upper extremity disorders, They observed that the work related load of the neck muscles especially trapezius in computer work is influenced by the computer workstation layout and individual working techniques which includes altered neck and shoulder posture which will lead to altered scapular position.

Eltayeb et al. found that neck and shoulder complaints significantly more often than the other upper extremity region at office workers and they associated these complaints with poor head and body posture and work demands.^[18] Like these studies, finding that work posture lead to changes in the musculoskeletal system at office workers. A number of previously published studies concerning shoulder and neck pain have been included both mechanical and psychosocial exposures. Better work conditions and posture alignment should be ensured in office workers so that may be protective of scapular dyskinesia.

5. Conclusion

In present study, it concludes that scapular dyskinesia is prevalent among desk job worker in veteran bank professions. The result of this study shows that there is significant difference between all three positions that is arms by the side, hands on hip and arms elevated to 90° of shoulder abduction in scaption with maximal internal rotation and 1 kg load in their hands. After completion of the study, the result showed that prevalence of scapular dyskinesia in desk job worker in veteran bank professions was 46%.

6. Future Scope

Further, research might be carried out on the Prevalence of Scapular Dyskinesia in other Professionals settings and it also suggested that Modified Lateral Scapular Slide Test (MLSST) can be assessed Pre Exercise and Post Exercise.

Limitation of the study is that, the Age of participants was not homogen, a proportion of their gender was different and hand dominance was not included in the study.

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